

<110> PROFOS AG

<120> Verfahren zum Nachweis von Endotoxin

<130> PRO-013 PCT

<140> unknown

<141> 2004-12-20

<150> DE 103 60 844.3

<151> 2003-12-20

<160> 15

<170> PatentIn version 3.1

<210> 1

<211> 78

<212> DNA

<213> artificial sequence

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<223> primer

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aatacatatc aacacggt 78

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aatacatatc aacacggt 78

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aatacatatc aacacgtt 78

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<211> 19

<212> PRT

<213> artificial sequence

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Met Ala Ser Trp Ser His Pro Gln Phe Glu Lys Gly Ala Ser Asn Asn
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Thr Tyr Gln

<210> 6

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<212> PRT

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<223> strep tag

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Met Ala Cys Trp Ser His Pro Gln Phe Glu Lys Gly Ala Ser Asn Asn
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Thr Tyr Gln

<210> 7

<211> 19

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<223> strep tag

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Met Ala Ser Trp Ser His Pro Gln Phe Glu Lys Gly Ala Cys Asn Asn
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Thr Tyr Gln

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<212> PRT

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<223> T4p12 with strep tag

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Thr	Tyr	Gln	His	Val	Ser	Asn	Glu	Ser	Arg	Tyr	Val	Lys	Phe	Asp	Pro	20	25	30	
Thr	Asp	Thr	Asn	Phe	Pro	Pro	Glu	Ile	Thr	Asp	Val	Gln	Ala	Ala	Ile	35	40	45	
Ala	Ala	Ile	Ser	Pro	Ala	Gly	Val	Asn	Gly	Val	Pro	Asp	Ala	Ser	Ser	50	55	60	
Thr	Thr	Lys	Gly	Ile	Leu	Phe	Leu	Ala	Thr	Glu	Gln	Glu	Val	Ile	Asp	65	70	75	80
Gly	Thr	Asn	Asn	Thr	Lys	Ala	Val	Thr	Pro	Ala	Thr	Leu	Ala	Thr	Arg	85	90	95	
Leu	Ser	Tyr	Pro	Asn	Ala	Thr	Glu	Ala	Val	Tyr	Gly	Leu	Thr	Arg	Tyr	100	105	110	
Ser	Thr	Asp	Asp	Glu	Ala	Ile	Ala	Gly	Val	Asn	Asn	Glu	Ser	Ser	Ile	115	120	125	
Thr	Pro	Ala	Lys	Phe	Thr	Val	Ala	Leu	Asn	Asn	Val	Phe	Glu	Thr	Arg	130	135	140	
Val	Ser	Thr	Glu	Ser	Ser	Asn	Gly	Val	Ile	Lys	Ile	Ser	Ser	Leu	Pro	145	150	155	160
Gln	Ala	Leu	Ala	Gly	Ala	Asp	Asp	Thr	Thr	Ala	Met	Thr	Pro	Leu	Lys	165	170	175	
Thr	Gln	Gln	Leu	Ala	Val	Lys	Leu	Ile	Ala	Gln	Ile	Ala	Pro	Ser	Lys	180	185	190	
Asn	Ala	Ala	Thr	Glu	Ser	Glu	Gln	Gly	Val	Ile	Gln	Leu	Ala	Thr	Val	195	200	205	
Ala	Gln	Ala	Arg	Gln	Gly	Thr	Leu	Arg	Glu	Gly	Tyr	Ala	Ile	Ser	Pro	210	215	220	
Tyr	Thr	Phe	Met	Asn	Ser	Thr	Ala	Thr	Glu	Glu	Tyr	Lys	Gly	Val	Ile	225	230	235	240
Lys	Leu	Gly	Thr	Gln	Ser	Glu	Val	Asn	Ser	Asn	Asn	Ala	Ser	Val	Ala	245	250	255	
Val	Thr	Gly	Ala	Thr	Leu	Asn	Gly	Arg	Gly	Ser	Thr	Thr	Ser	Met	Arg	260	265	270	
Gly	Val	Val	Lys	Leu	Thr	Thr	Thr	Ala	Gly	Ser	Gln	Ser	Gly	Gly	Asp	275	280	285	
Ala	Ser	Ser	Ala	Leu	Ala	Trp	Asn	Ala	Asp	Val	Ile	His	Gln	Arg	Gly	290	295	300	
Gly	Gln	Thr	Ile	Asn	Gly	Thr	Leu	Arg	Ile	Asn	Asn	Thr	Leu	Thr	Ile	305	310	315	320

Ala Ser Gly Gly Ala Asn Ile Thr Gly Thr Val Asn Met Thr Gly Gly
 325 330 335

Tyr Ile Gln Gly Lys Arg Val Val Thr Gln Asn Glu Ile Asp Arg Thr
 340 345 350

Ile Pro Val Gly Ala Ile Met Met Trp Ala Ala Asp Ser Leu Pro Ser
 355 360 365

Asp Ala Trp Arg Phe Cys His Gly Gly Thr Val Ser Ala Ser Asp Cys
 370 375 380

Pro Leu Tyr Ala Ser Arg Ile Gly Thr Arg Tyr Gly Gly Ser Ser Ser
 385 390 395 400

Asn Pro Gly Leu Pro Asp Met Arg Gly Leu Phe Val Arg Gly Ser Gly
 405 410 415

Arg Gly Ser His Leu Thr Asn Pro Asn Val Asn Gly Asn Asp Gln Phe
 420 425 430

Gly Lys Pro Arg Leu Gly Val Gly Cys Thr Gly Gly Tyr Val Gly Glu
 435 440 445

Val Gln Lys Gln Gln Met Ser Tyr His Lys His Ala Gly Gly Phe Gly
 450 455 460

Glu Tyr Asp Asp Ser Gly Ala Phe Gly Asn Thr Arg Arg Ser Asn Phe
 465 470 475 480

Val Gly Thr Arg Lys Gly Leu Asp Trp Asp Asn Arg Ser Tyr Phe Thr
 485 490 495

Asn Asp Gly Tyr Glu Ile Asp Pro Ala Ser Gln Arg Asn Ser Arg Tyr
 500 505 510

Thr Leu Asn Arg Pro Glu Leu Ile Gly Asn Glu Thr Arg Pro Trp Asn
 515 520 525

Ile Ser Leu Asn Tyr Ile Ile Lys Val Lys Glu
 530 535

<210> 9
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 <213> protein p12 of T2 phage

<400> 9

Met Ser Asn Asn Thr Tyr Gln His Val Ser Asn Glu Ser Arg Tyr Val
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Lys Phe Asp Pro Thr Asp Thr Asn Phe Pro Pro Glu Ile Thr Asp Val
 20 25 30

Gln Ala Ala Ile Ala Ala Ile Ser Pro Ala Gly Val Asn Gly Val Pro
 35 40 45

Asp Ala Ser Ser Thr Thr Lys Gly Ile Leu Phe Leu Ala Thr Glu Gln
 50 55 60

Glu Val Ile Asp Gly Thr Asn Asn Thr Lys Ala Val Thr Pro Ala Thr

65					70					75					80				
Leu	Ala	Thr	Arg	Leu	Ser	Tyr	Pro	Asn	Ala	Thr	Glu	Ala	Val	Tyr	Gly				
				85					90					95					
Leu	Thr	Arg	Tyr	Ser	Thr	Asp	Asp	Glu	Ala	Ile	Ala	Gly	Val	Asn	Asn				
			100					105					110						
Glu	Ser	Ser	Ile	Thr	Pro	Ala	Lys	Phe	Thr	Val	Ala	Leu	Asn	Asn	Val				
			115				120					125							
Phe	Glu	Thr	Arg	Val	Ser	Thr	Glu	Ser	Ser	Asn	Gly	Val	Ile	Lys	Ile				
	130					135					140								
Ser	Ser	Leu	Pro	Gln	Ala	Leu	Ala	Gly	Ala	Asp	Asp	Thr	Thr	Ala	Met				
145					150					155					160				
Thr	Pro	Leu	Lys	Thr	Gln	Gln	Leu	Ala	Val	Lys	Leu	Ile	Ala	Gln	Ile				
				165					170					175					
Ala	Pro	Ser	Lys	Asn	Ala	Ala	Thr	Glu	Ser	Glu	Gln	Gly	Val	Ile	Gln				
			180					185					190						
Leu	Ala	Thr	Val	Ala	Gln	Ala	Arg	Gln	Gly	Thr	Leu	Arg	Glu	Gly	Tyr				
			195				200					205							
Ala	Ile	Ser	Pro	Tyr	Thr	Phe	Met	Asn	Ser	Thr	Ala	Thr	Glu	Glu	Tyr				
	210					215					220								
Lys	Gly	Val	Ile	Lys	Leu	Gly	Thr	Gln	Ser	Glu	Val	Asn	Ser	Asn	Asn				
225					230					235					240				
Ala	Ser	Val	Ala	Val	Thr	Gly	Ala	Thr	Leu	Asn	Gly	Arg	Gly	Ser	Thr				
				245					250					255					
Thr	Ser	Met	Arg	Gly	Val	Val	Lys	Leu	Thr	Thr	Thr	Ala	Gly	Ser	Gln				
			260					265					270						
Ser	Gly	Gly	Asp	Ala	Ser	Ser	Ala	Leu	Ala	Trp	Asn	Ala	Asp	Val	Ile				
			275				280					285							
His	Gln	Arg	Gly	Gly	Gln	Thr	Ile	Asn	Gly	Thr	Leu	Arg	Ile	Asn	Asn				
	290					295					300								
Thr	Leu	Thr	Ile	Ala	Ser	Gly	Gly	Ala	Asn	Ile	Thr	Gly	Thr	Val	Asn				
305					310					315					320				
Met	Thr	Gly	Gly	Tyr	Ile	Gln	Gly	Lys	Arg	Val	Val	Thr	Gln	Asn	Glu				
				325					330					335					
Ile	Asp	Arg	Thr	Ile	Pro	Val	Gly	Ala	Ile	Met	Met	Trp	Ala	Ala	Asp				
			340					345					350						
Ser	Leu	Pro	Ser	Asp	Ala	Trp	Arg	Phe	Cys	His	Gly	Gly	Thr	Val	Ser				
			355				360					365							
Ala	Ser	Asp	Cys	Pro	Leu	Tyr	Ala	Ser	Arg	Ile	Gly	Thr	Arg	Tyr	Gly				
						375					380								
Gly	Thr	Ser	Ser	Asn	Pro	Gly	Leu	Pro	Asp	Met	Arg	Gly	Leu	Phe	Val				
385					390					395					400				
Arg	Gly	Ser	Gly	Arg	Gly	Ser	His	Leu	Thr	Asn	Pro	Asn	Val	Asn	Gly				
				405					410					415					

Asn	Asp	Gln	Phe	Gly	Lys	Pro	Arg	Leu	Gly	Val	Gly	Cys	Thr	Gly	Gly
			420					425					430		
Tyr	Val	Gly	Glu	Val	Gln	Lys	Gln	Gln	Met	Ser	Tyr	His	Lys	His	Ala
		435					440					445			
Gly	Gly	Phe	Gly	Glu	Tyr	Asp	Asp	Ser	Gly	Ala	Phe	Gly	Asn	Thr	Arg
	450					455					460				
Arg	Ser	Asn	Phe	Val	Gly	Thr	Arg	Lys	Gly	Leu	Asp	Trp	Asp	Asn	Arg
465					470					475					480
Ser	Tyr	Phe	Thr	Asn	Asp	Gly	Tyr	Glu	Ile	Asp	Pro	Ala	Ser	Gln	Arg
				485					490					495	
Asn	Ser	Arg	Tyr	Thr	Leu	Asn	Arg	Pro	Glu	Leu	Ile	Gly	Asn	Glu	Thr
			500					505					510		
Arg	Pro	Trp	Asn	Ile	Ser	Leu	Asn	Tyr	Ile	Ile	Lys	Val	Lys	Glu	
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<210> 10
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 <212> PRT
 <213> protein p12 of T4 phage

<400> 10

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			20					25					30		
His	Ala	Ala	Ile	Ala	Ala	Ile	Ser	Pro	Ala	Gly	Val	Asn	Gly	Val	Pro
		35					40					45			
Asp	Ala	Ser	Ser	Thr	Thr	Lys	Gly	Ile	Leu	Phe	Ile	Pro	Thr	Glu	Gln
	50					55					60				
Glu	Val	Ile	Asp	Gly	Thr	Asn	Asn	Thr	Lys	Ala	Val	Thr	Pro	Ala	Thr
65					70					75					80
Leu	Ala	Thr	Arg	Leu	Ser	Tyr	Pro	Asn	Ala	Thr	Glu	Thr	Val	Tyr	Gly
				85					90					95	
Leu	Thr	Arg	Tyr	Ser	Thr	Asn	Asp	Glu	Ala	Ile	Ala	Gly	Val	Asn	Asn
			100					105					110		
Glu	Ser	Ser	Ile	Thr	Pro	Ala	Lys	Phe	Thr	Val	Ala	Leu	Asn	Asn	Ala
		115					120					125			
Phe	Glu	Thr	Arg	Val	Ser	Thr	Glu	Ser	Ser	Asn	Gly	Val	Ile	Lys	Ile
	130					135					140				
Ser	Ser	Leu	Pro	Gln	Ala	Leu	Ala	Gly	Ala	Asp	Asp	Thr	Thr	Ala	Met
145					150					155					160
Thr	Pro	Leu	Lys	Thr	Gln	Gln	Leu	Ala	Ile	Lys	Leu	Ile	Ala	Gln	Ile
				165					170					175	
Ala	Pro	Ser	Glu	Thr	Thr	Ala	Thr	Glu	Ser	Asp	Gln	Gly	Val	Val	Gln

180					185					190					
Leu	Ala	Thr	Val	Ala	Gln	Val	Arg	Gln	Gly	Thr	Leu	Arg	Glu	Gly	Tyr
		195					200					205			
Ala	Ile	Ser	Pro	Tyr	Thr	Phe	Met	Asn	Ser	Ser	Ser	Thr	Glu	Glu	Tyr
	210					215					220				
Lys	Gly	Val	Ile	Lys	Leu	Gly	Thr	Gln	Ser	Glu	Val	Asn	Ser	Asn	Asn
225					230					235					240
Ala	Ser	Val	Ala	Val	Thr	Gly	Ala	Thr	Leu	Asn	Gly	Arg	Gly	Ser	Thr
				245					250					255	
Thr	Ser	Met	Arg	Gly	Val	Val	Lys	Leu	Thr	Thr	Thr	Ala	Gly	Ser	Gln
			260					265					270		
Ser	Gly	Gly	Asp	Ala	Ser	Ser	Ala	Leu	Ala	Trp	Asn	Ala	Asp	Val	Ile
		275					280					285			
Gln	Gln	Arg	Gly	Gly	Gln	Ile	Ile	Tyr	Gly	Thr	Leu	Arg	Ile	Glu	Asp
	290					295					300				
Thr	Phe	Thr	Ile	Ala	Asn	Gly	Gly	Ala	Asn	Ile	Thr	Gly	Thr	Val	Arg
305					310					315					320
Met	Thr	Gly	Gly	Tyr	Ile	Gln	Gly	Asn	Arg	Ile	Val	Thr	Gln	Asn	Glu
				325					330					335	
Ile	Asp	Arg	Thr	Ile	Pro	Val	Gly	Ala	Ile	Met	Met	Trp	Ala	Ala	Asp
			340					345					350		
Ser	Leu	Pro	Ser	Asp	Ala	Trp	Arg	Phe	Cys	His	Gly	Gly	Thr	Val	Ser
		355					360					365			
Ala	Ser	Asp	Cys	Pro	Leu	Tyr	Ala	Ser	Arg	Ile	Gly	Thr	Arg	Tyr	Gly
	370					375					380				
Gly	Asn	Pro	Ser	Asn	Pro	Gly	Leu	Pro	Asp	Met	Arg	Gly	Leu	Phe	Val
385					390					395					400
Arg	Gly	Ser	Gly	Arg	Gly	Ser	His	Leu	Thr	Asn	Pro	Asn	Val	Asn	Gly
				405					410					415	
Asn	Asp	Gln	Phe	Gly	Lys	Pro	Arg	Leu	Gly	Val	Gly	Cys	Thr	Gly	Gly
			420					425					430		
Tyr	Val	Gly	Glu	Val	Gln	Ile	Gln	Gln	Met	Ser	Tyr	His	Lys	His	Ala
		435					440					445			
Gly	Gly	Phe	Gly	Glu	His	Asp	Asp	Leu	Gly	Ala	Phe	Gly	Asn	Thr	Arg
	450					455					460				
Arg	Ser	Asn	Phe	Val	Gly	Thr	Arg	Lys	Gly	Leu	Asp	Trp	Asp	Asn	Arg
465					470					475					480
Ser	Tyr	Phe	Thr	Asn	Asp	Gly	Tyr	Glu	Ile	Asp	Pro	Glu	Ser	Gln	Arg
				485				490						495	
Asn	Ser	Lys	Tyr	Thr	Leu	Asn	Arg	Pro	Glu	Leu	Ile	Gly	Asn	Glu	Thr
			500					505					510		
Arg	Pro	Trp	Asn	Ile	Ser	Leu	Asn	Tyr	Ile	Ile	Lys	Val	Lys	Glu	
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<210> 11
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 <212> PRT
 <213> protein p12 of PP01 phage

<400> 11

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			20					25					30		
Gln	Ser	Ala	Leu	Ser	Lys	Ile	Ser	Asn	Ile	Gly	Val	Asn	Gly	Ile	Pro
		35					40					45			
Asp	Ala	Ser	Met	Glu	Val	Lys	Gly	Ile	Ala	Met	Ile	Ala	Ser	Glu	Gln
	50					55					60				
Glu	Val	Leu	Asp	Gly	Thr	Asn	Asn	Ser	Lys	Ile	Val	Thr	Pro	Ala	Thr
65					70					75					80
Leu	Ala	Thr	Arg	Leu	Leu	Tyr	Pro	Asn	Ala	Thr	Glu	Thr	Lys	Tyr	Gly
				85					90					95	
Leu	Thr	Arg	Tyr	Ser	Thr	Asn	Glu	Glu	Thr	Leu	Glu	Gly	Ser	Asp	Asn
			100					105					110		
Asn	Ser	Ser	Ile	Thr	Pro	Gln	Lys	Leu	Lys	Tyr	His	Thr	Asp	Asp	Val
		115					120					125			
Phe	Gln	Asn	Arg	Tyr	Ser	Ser	Glu	Ser	Ser	Asn	Gly	Val	Ile	Lys	Ile
	130					135					140				
Ser	Ser	Thr	Pro	Ala	Ala	Leu	Ala	Gly	Val	Asp	Asp	Thr	Thr	Ala	Met
145					150					155					160
Thr	Pro	Leu	Lys	Thr	Gln	Lys	Leu	Ala	Ile	Lys	Leu	Ile	Ser	Gln	Ile
				165					170					175	
Ala	Pro	Ser	Glu	Asp	Thr	Ala	Ser	Glu	Ser	Val	Arg	Gly	Val	Val	Gln
			180					185					190		
Leu	Ser	Thr	Val	Ala	Gln	Thr	Arg	Gln	Gly	Thr	Leu	Arg	Glu	Gly	Tyr
		195					200					205			
Ala	Ile	Ser	Pro	Tyr	Thr	Phe	Met	Asn	Ser	Val	Ala	Thr	Gln	Glu	Tyr
	210					215					220				
Lys	Gly	Val	Ile	Arg	Leu	Gly	Thr	Gln	Ser	Glu	Ile	Asn	Ser	Asn	Leu
225					230					235					240
Gly	Asp	Val	Ala	Val	Thr	Gly	Glu	Thr	Leu	Asn	Gly	Arg	Gly	Ala	Thr
				245					250					255	
Gly	Ser	Met	Arg	Gly	Val	Val	Lys	Leu	Thr	Thr	Gln	Ala	Gly	Ile	Ala
			260					265					270		
Pro	Glu	Gly	Asp	Ser	Ser	Gly	Ala	Leu	Ala	Trp	Asn	Ala	Asp	Val	Ile
		275					280					285			
Asn	Thr	Arg	Gly	Gly	Gln	Thr	Ile	Asn	Gly	Ser	Leu	Asn	Leu	Asp	His

290 295 300
 Leu Thr Ala Asn Gly Ile Trp Ser Arg Gly Gly Met Trp Lys Asn Gly
 305 310 315 320
 Asp Gln Pro Val Ala Thr Glu Arg Tyr Ala Ser Glu Arg Val Pro Val
 325 330 335
 Gly Thr Ile Met Met Phe Ala Gly Asp Ser Ala Pro Pro Gly Trp Ile
 340 345 350
 Met Cys His Gly Gly Thr Val Ser Gly Asp Gln Tyr Pro Asp Tyr Arg
 355 360 365
 Asn Thr Val Gly Thr Arg Phe Gly Gly Asp Trp Asn Asn Pro Gly Ile
 370 375 380
 Pro Asp Met Arg Gly Leu Phe Val Arg Gly Ala Gly Thr Gly Gly His
 385 390 395 400
 Ile Leu Asn Gln Arg Gly Gln Asp Gly Tyr Gly Lys Asp Arg Leu Gly
 405 410 415
 Val Gly Cys Asp Gly Met His Val Gly Gly Val Gln Ala Gln Gln Ile
 420 425 430
 Ser Tyr His Lys His Ala Gly Ala Trp Gly Glu Asn Gly Asn Asn Arg
 435 440 445
 Gly Tyr Ala Pro Phe Gly Ala Ser Asn Gly Ser Gly Tyr Leu Gly Asn
 450 455 460
 Gly Arg Ser Ala Asp Trp Asp Asn His Leu Phe Phe Thr Asn Asp Gly
 465 470 475 480
 Phe Glu Met Gly Gly Pro Arg Asp Ser Phe Gly Thr Leu Asn Arg Glu
 485 490 495
 Gly Leu Ile Gly Tyr Glu Thr Arg Pro Trp Asn Ile Ser Leu Asn Tyr
 500 505 510
 Ile Ile Lys Ile His Tyr
 515

<210> 12
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 <212> PRT
 <213> protein p12 of RB69 phage

<400> 12

Met Ser Asn Asn Thr Tyr Gln His Val Ser Asn Glu Ser Val Tyr Val
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 Glu Phe Asp Pro Thr Gly Ser Asn Phe Asp Ser Ser Ile Thr Asn Val
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 Gln Ala Ala Leu Ala Ser Ile Ser Ala Tyr Gly Val Lys Gly Val Pro
 35 40 45
 Asp Ala Ser Glu Ala Glu Lys Gly Val Ile Gln Leu Ala Thr Glu Gln
 50 55 60

Glu	Val	Leu	Asp	Gly	Phe	Asn	Ser	Thr	Lys	Ala	Val	Thr	Pro	Ala	Thr
65					70					75					80
Leu	Asn	Ala	Arg	Leu	Gln	Tyr	Pro	Asn	Ala	Ser	Glu	Thr	Gln	Tyr	Gly
				85					90					95	
Val	Thr	Lys	Tyr	Ala	Thr	Gln	Glu	Glu	Ala	Ile	Ala	Gly	Thr	Leu	Asp
			100					105					110		
Thr	Val	Ser	Ile	Thr	Pro	Leu	Lys	Leu	Asn	Gln	Thr	Ile	Asp	Asn	Thr
		115					120					125			
Phe	Ser	Thr	Arg	Tyr	Ser	Thr	Glu	Thr	Thr	Asn	Gly	Val	Ile	Lys	Ile
	130					135					140				
Ala	Thr	Gln	Thr	Ala	Ala	Leu	Ala	Gly	Ser	Asp	Asp	Thr	Thr	Ala	Met
145					150					155					160
Thr	Pro	Leu	Lys	Thr	Gln	Gln	Leu	Ala	Ile	Lys	Leu	Ile	Ser	Gln	Ile
				165					170					175	
Ala	Pro	Asn	Asn	Asp	Pro	Ala	Ser	Glu	Ser	Ile	Thr	Gly	Val	Val	Arg
			180					185					190		
Leu	Ala	Thr	Val	Ala	Gln	Thr	Arg	Gln	Gly	Thr	Leu	Arg	Glu	Gly	Tyr
		195					200					205			
Ala	Ile	Ser	Pro	Tyr	Thr	Phe	Met	Asn	Ser	Val	Ala	Thr	Gln	Glu	Tyr
	210					215					220				
Lys	Gly	Val	Ile	Arg	Leu	Gly	Thr	Gln	Ala	Glu	Ile	Asn	Ser	Asn	Leu
225					230					235					240
Gly	Asp	Val	Ala	Val	Thr	Gly	Glu	Thr	Leu	Asn	Gly	Arg	Gly	Ala	Thr
				245					250					255	
Gly	Ser	Met	Arg	Gly	Val	Val	Lys	Leu	Thr	Thr	Gln	Ala	Gly	Val	Ala
			260					265					270		
Pro	Glu	Gly	Asp	Ser	Ser	Gly	Ala	Leu	Ala	Trp	Asn	Ala	Asp	Val	Ile
		275					280					285			
Asn	Thr	Arg	Gly	Gly	Gln	Thr	Ile	Asn	Gly	Ser	Leu	Asn	Leu	Asp	His
	290					295					300				
Leu	Thr	Ala	Asn	Gly	Ile	Trp	Ser	Arg	Gly	Gly	Met	Trp	Lys	Asn	Gly
305					310					315					320
Asp	Gln	Pro	Val	Ala	Thr	Glu	Arg	Tyr	Ala	Ser	Glu	Arg	Val	Pro	Val
				325					330					335	
Gly	Thr	Ile	Gln	Met	Phe	Ala	Gly	Asp	Ser	Ala	Pro	Pro	Gly	Trp	Val
			340					345					350		
Leu	Cys	His	Gly	Gly	Thr	Ile	Ser	Gly	Asp	Gln	Phe	Pro	Asp	Tyr	Arg
		355					360					365			
Asn	Val	Val	Gly	Thr	Arg	Phe	Gly	Gly	Asp	Trp	Asn	Asn	Pro	Gly	Ile
	370					375					380				
Pro	Asp	Met	Arg	Gly	Leu	Phe	Val	Arg	Gly	Ala	Gly	Thr	Gly	Ser	His
385					390					395					400
Ile	Leu	Asn	Asn	Arg	Gly	Gln	Asp	Gly	Tyr	Gly	Lys	Asp	Arg	Leu	Gly

405 410 415
 Val Gly Cys Asp Gly Met His Val Gly Gly Val Gln Ala Gln Gln Met
 420 425 430
 Ser Tyr His Lys His Ala Gly Gly Trp Gly Glu Phe Gln Arg His Glu
 435 440 445
 Ala Pro Phe Gly Ala Ser Val Tyr Gln Gly Tyr Leu Gly Thr Arg Lys
 450 455 460
 Tyr Ser Asp Trp Asp Asn Ala Ser Tyr Phe Thr Asn Asp Gly Phe Glu
 465 470 475 480
 Leu Gly Gly His Arg Asp Ala Thr Gly Thr Leu Asn Arg Glu Gly Leu
 485 490 495
 Ile Gly Tyr Glu Thr Arg Pro Trp Asn Ile Ser Leu Asn Tyr Ile Ile
 500 505 510
 Lys Val His Tyr
 515

<210> 13
 <211> 516
 <212> PRT
 <213> protein p12 of AR1 phage

<400> 13

Met Ser Asn Asn Thr Tyr Gln His Val Ser Asn Glu Ser Lys Tyr Val
 1 5 10 15
 Lys Phe Asp Pro Thr Gly Ser Asn Phe Pro Asp Thr Val Thr Thr Val
 20 25 30
 Gln Ser Ala Leu Ser Lys Ile Ser Asn Ile Gly Val Asn Gly Ile Pro
 35 40 45
 Asp Ala Thr Met Glu Val Lys Gly Ile Ala Met Ile Ala Ser Glu Gln
 50 55 60
 Glu Val Leu Asp Gly Thr Asn Asn Ser Lys Ile Val Thr Pro Ala Thr
 65 70 75 80
 Leu Ala Thr Arg Leu Leu Tyr Pro Asn Ala Thr Glu Thr Lys Tyr Gly
 85 90 95
 Leu Thr Arg Tyr Ser Thr Asn Glu Glu Thr Leu Glu Gly Ser Asp Asn
 100 105 110
 Asn Ser Ser Ile Thr Pro Gln Lys Leu Lys Tyr His Thr Asp Asp Val
 115 120 125
 Phe Gln Asn Arg Tyr Ser Ser Glu Ser Ser Asn Gly Val Ile Lys Ile
 130 135 140
 Ser Ser Thr Pro Ala Ala Leu Ala Gly Val Asp Asp Thr Thr Ala Met
 145 150 155 160
 Thr Pro Leu Lys Thr Gln Lys Leu Ala Ile Lys Leu Ile Ser Gln Ile
 165 170 175

Ala	Pro	Ser	Glu	Asp	Thr	Ala	Ser	Glu	Ser	Val	Arg	Gly	Val	Val	Gln
			180					185					190		
Leu	Ser	Thr	Val	Ala	Gln	Thr	Arg	Gln	Gly	Thr	Leu	Arg	Glu	Gly	Tyr
			195				200					205			
Ala	Ile	Ser	Pro	Tyr	Thr	Phe	Met	Asn	Ser	Val	Ala	Thr	Gln	Glu	Tyr
	210					215					220				
Lys	Gly	Val	Ile	Arg	Leu	Gly	Thr	Gln	Ser	Glu	Ile	Asn	Ser	Asn	Leu
225					230					235					240
Gly	Asp	Val	Ala	Val	Thr	Gly	Gly	Thr	Leu	Asn	Gly	Arg	Gly	Ala	Thr
				245					250					255	
Gly	Ser	Met	Arg	Gly	Val	Val	Lys	Leu	Thr	Thr	Gln	Ala	Gly	Ile	Ala
			260					265					270		
Pro	Glu	Gly	Asp	Ser	Ser	Gly	Ala	Leu	Ala	Trp	Asn	Ala	Asp	Val	Ile
			275				280					285			
Asn	Thr	Arg	Gly	Gly	Gln	Thr	Ile	Asn	Gly	Ser	Leu	Asn	Leu	Asp	His
	290					295					300				
Leu	Thr	Ala	Asn	Gly	Ile	Trp	Ser	Arg	Gly	Gly	Met	Trp	Lys	Asn	Gly
305					310					315					320
Asp	Gln	Pro	Val	Ala	Thr	Glu	Arg	Tyr	Ala	Ser	Glu	Arg	Val	Pro	Val
				325					330					335	
Gly	Thr	Ile	Met	Met	Phe	Ala	Gly	Asp	Ser	Ala	Pro	Pro	Gly	Trp	Ile
			340					345					350		
Met	Cys	His	Gly	Gly	Thr	Val	Ser	Gly	Asp	Gln	Tyr	Pro	Asp	Tyr	Arg
			355				360					365			
Asn	Thr	Val	Gly	Thr	Arg	Phe	Gly	Gly	Asp	Trp	Asn	Asn	Pro	Gly	Ile
	370					375					380				
Pro	Asp	Met	Arg	Gly	Leu	Phe	Val	Arg	Gly	Ala	Gly	Thr	Gly	Gly	His
385					390					395					400
Ile	Leu	Asn	Gln	Arg	Gly	Gln	Asp	Gly	Tyr	Gly	Lys	Asp	Arg	Leu	Gly
				405					410					415	
Val	Gly	Cys	Asp	Gly	Met	His	Val	Gly	Gly	Val	Gln	Ala	Gln	Gln	Met
			420					425					430		
Ser	Tyr	His	Lys	His	Ala	Gly	Gly	Trp	Gly	Glu	Tyr	Asn	Arg	Ser	Glu
			435				440					445			
Gly	Pro	Phe	Gly	Ala	Ser	Val	Tyr	Gln	Gly	Tyr	Leu	Gly	Thr	Arg	Lys
	450					455					460				
Tyr	Ser	Asp	Trp	Asp	Asn	Ala	Ser	Tyr	Phe	Thr	Asn	Asp	Gly	Phe	Glu
465					470					475					480
Leu	Gly	Gly	Pro	Arg	Asp	Ala	Leu	Gly	Thr	Leu	Asn	Arg	Glu	Gly	Leu
				485					490					495	
Ile	Gly	Tyr	Glu	Thr	Arg	Pro	Trp	Asn	Ile	Ser	Leu	Asn	Tyr	Ile	Ile
			500					505					510		
Lys	Ile	His	Tyr												

515

<210> 14
 <211> 527
 <212> PRT
 <213> protein p12 of K3 phage

<400> 14

Met	Ser	Asn	Asn	Thr	Tyr	Gln	His	Val	Ser	Asn	Glu	Ser	Arg	Tyr	Val	1	5	10	15
Lys	Phe	Asp	Pro	Thr	Asp	Thr	Asn	Phe	Pro	Pro	Glu	Ile	Thr	Asp	Val	20	25	30	
Gln	Ala	Ala	Ile	Ala	Ala	Ile	Ser	Pro	Ala	Gly	Val	Asn	Gly	Val	Pro	35	40	45	
Asp	Ala	Ser	Ser	Thr	Thr	Lys	Gly	Ile	Leu	Phe	Leu	Ala	Thr	Glu	Gln	50	55	60	
Glu	Val	Ile	Asp	Gly	Thr	Asn	Asn	Thr	Lys	Ala	Val	Thr	Pro	Ala	Thr	65	70	75	80
Leu	Ala	Thr	Arg	Leu	Ser	Tyr	Pro	Asn	Ala	Thr	Glu	Thr	Val	Tyr	Gly	85	90	95	
Leu	Thr	Arg	Tyr	Ser	Thr	Asn	Asp	Glu	Ala	Ile	Ala	Gly	Val	Asn	Asn	100	105	110	
Glu	Ser	Ser	Ile	Thr	Pro	Ala	Lys	Phe	Thr	Val	Ala	Leu	Asn	Asn	Ala	115	120	125	
Phe	Glu	Thr	Arg	Val	Ser	Thr	Glu	Ser	Ser	Asn	Gly	Val	Ile	Lys	Ile	130	135	140	
Ser	Ser	Leu	Pro	Gln	Ala	Leu	Ala	Gly	Ala	Asp	Asp	Thr	Thr	Ala	Met	145	150	155	160
Thr	Pro	Leu	Lys	Thr	Gln	Gln	Leu	Ala	Ile	Lys	Leu	Ile	Ala	Gln	Ile	165	170	175	
Ala	Pro	Ser	Glu	Thr	Thr	Ala	Thr	Glu	Ser	Asp	Gln	Gly	Val	Val	Gln	180	185	190	
Leu	Ala	Thr	Val	Ala	Gln	Val	Arg	Gln	Gly	Thr	Leu	Arg	Glu	Gly	Tyr	195	200	205	
Ala	Ile	Ser	Pro	Tyr	Thr	Phe	Met	Asn	Ser	Ser	Ala	Thr	Glu	Glu	Tyr	210	215	220	
Lys	Gly	Val	Ile	Lys	Leu	Gly	Thr	Gln	Ser	Glu	Val	Asn	Ser	Asn	Asn	225	230	235	240
Ala	Ser	Val	Ala	Val	Thr	Gly	Ala	Thr	Leu	Asn	Gly	Arg	Gly	Ser	Thr	245	250	255	
Thr	Ser	Met	Arg	Gly	Val	Val	Arg	Leu	Thr	Thr	Thr	Ala	Gly	Ser	Gln	260	265	270	
Ser	Gly	Gly	Asp	Ala	Ser	Ser	Ala	Leu	Ala	Trp	Asn	Ala	Asp	Val	Ile	275	280	285	

His Gln Arg Gly Gly Gln Thr Ile Asn Gly Thr Leu Arg Ile Asn Asn
 290 295 300
 Thr Leu Thr Ile Ala Ser Gly Gly Ala Asn Ile Thr Gly Thr Val Asn
 305 310 315 320
 Met Thr Gly Gly Tyr Ile Gln Gly Lys Arg Val Val Thr Gln Asn Glu
 325 330 335
 Ile Asp Arg Thr Ile Pro Val Gly Ala Ile Met Met Trp Ala Ala Asp
 340 345 350
 Ser Leu Pro Ser Asp Ala Trp Arg Phe Cys His Gly Gly Thr Val Ser
 355 360 365
 Ala Ser Asp Cys Pro Leu Tyr Ala Ser Arg Ile Gly Thr Arg Tyr Gly
 370 375 380
 Gly Ser Ser Ser Asn Pro Gly Leu Pro Asp Met Arg Gly Leu Phe Val
 385 390 395 400
 Arg Gly Ser Gly Arg Gly Ser His Leu Thr Asn Pro Asn Val Asn Gly
 405 410 415
 Asn Asp Gln Phe Gly Lys Pro Arg Leu Gly Val Gly Cys Thr Gly Gly
 420 425 430
 Tyr Val Gly Glu Val Gln Lys Gln Gln Met Ser Tyr His Lys His Ala
 435 440 445
 Gly Gly Phe Gly Glu Trp Asp Asp Ser Gly Ala Phe Gly Asn Thr Arg
 450 455 460
 Arg Ser Asn Phe Val Gly Thr Arg Lys Gly Leu Asp Trp Asp Asn Arg
 465 470 475 480
 Ser Tyr Phe Thr Asn Asp Gly Tyr Glu Ile Asp Pro Ala Ser Gln Arg
 485 490 495
 Asn Ser Arg Tyr Thr Leu Asn Arg Pro Glu Leu Ile Gly Asn Glu Thr
 500 505 510
 Arg Pro Trp Asn Ile Ser Leu Asn Tyr Ile Ile Lys Val Lys Glu
 515 520 525

<210> 15

<211> 516

<212> PRT

<213> protein p12 of RB32-33 phage

<400> 15

Met Ser Asn Asn Thr Tyr Gln His Val Ser Asn Glu Ser Lys Tyr Val
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 Lys Phe Asp Pro Val Gly Ser Asn Phe Pro Asp Thr Val Thr Val
 20 25 30
 Gln Ser Ala Leu Ser Lys Ile Ser Asn Ile Gly Val Asn Gly Ile Pro
 35 40 45
 Asp Ala Thr Met Glu Val Lys Gly Ile Ala Met Ile Ala Ser Glu Gln
 50 55 60

Glu 65	Val	Leu	Asp	Gly	Thr 70	Asn	Asn	Ser	Lys	Ile 75	Val	Thr	Pro	Ala	Thr 80
Leu	Ala	Thr	Arg	Leu 85	Leu	Tyr	Pro	Asn	Ala 90	Thr	Glu	Thr	Lys	Tyr 95	Gly
Leu	Thr	Arg	Tyr 100	Ser	Thr	Asn	Glu	Glu 105	Thr	Leu	Glu	Gly	Ser 110	Asp	Asn
Asn	Ser	Ser 115	Ile	Thr	Pro	Gln	Lys 120	Leu	Lys	Tyr	His	Thr 125	Asp	Asp	Val
Phe 130	Gln	Asn	Arg	Tyr	Ser	Ser 135	Glu	Ser	Ser	Asn	Gly 140	Val	Ile	Lys	Ile
Ser 145	Ser	Thr	Pro	Ala	Ala 150	Leu	Ala	Gly	Val	Asp 155	Asp	Thr	Thr	Ala	Met 160
Thr	Pro	Leu	Lys 165	Thr	Gln	Lys	Leu	Ala	Ile 170	Lys	Leu	Ile	Ser	Gln 175	Ile
Ala	Pro	Ser	Glu 180	Asp	Thr	Ala	Ser	Glu 185	Ser	Val	Arg	Gly	Val 190	Val	Gln
Leu	Ser	Thr 195	Val	Ala	Gln	Thr	Arg 200	Gln	Gly	Thr	Leu	Arg 205	Glu	Gly	Tyr
Ala 210	Ile	Ser	Pro	Tyr	Thr	Phe 215	Met	Asn	Ser	Val 220	Ala	Thr	Gln	Glu	Tyr
Lys 225	Gly	Val	Ile	Arg	Leu 230	Gly	Thr	Gln	Ser	Glu 235	Ile	Asn	Ser	Asn	Leu 240
Gly	Asp	Val	Ala	Val 245	Thr	Gly	Glu	Thr 250	Leu	Asn	Gly	Arg	Gly	Ala 255	Thr
Ser	Ser	Met 260	Arg	Gly	Val	Val	Lys 265	Leu	Thr	Thr	Gln	Ala	Gly 270	Ile	Ala
Pro	Glu	Gly 275	Asp	Gly	Ser	Gly	Ala 280	Leu	Ala	Trp	Asn	Ala 285	Asp	Val	Ile
Asn 290	Thr	Arg	Gly	Gly	Gln	Thr 295	Ile	Asn	Gly	Ser	Leu 300	Asn	Leu	Asp	His
Leu 305	Thr	Ala	Asn	Gly	Ile 310	Trp	Ser	Arg	Gly	Gly 315	Met	Trp	Lys	Asn	Gly 320
Asp	Gln	Pro	Val	Ala 325	Thr	Glu	Arg	Tyr	Ala 330	Ser	Glu	Arg	Val	Pro 335	Val
Gly	Thr	Ile 340	Met	Met	Phe	Ala	Gly 345	Asp	Ser	Ala	Pro	Pro	Gly 350	Trp	Ile
Met	Cys	His 355	Gly	Gly	Thr	Val	Ser 360	Gly	Asp	Gln	Tyr	Pro 365	Asp	Tyr	Arg
Asn 370	Thr	Val	Gly	Ala	Arg	Phe 375	Gly	Gly	Asp	Trp	Asn 380	Asn	Pro	Gly	Ile
Pro 385	Asp	Met	Arg	Gly	Leu 390	Phe	Val	Arg	Gly	Ala 395	Gly	Thr	Gly	Gly	His 400

Ile	Leu	Asn	Gln	Arg	Gly	Gln	Asp	Gly	Tyr	Gly	Lys	Asp	Arg	Leu	Gly
				405					410					415	
Val	Gly	Cys	Asp	Gly	Met	His	Val	Gly	Gly	Val	Gln	Ala	Gln	Gln	Met
			420					425					430		
Ser	Tyr	His	Lys	His	Ala	Gly	Gly	Trp	Gly	Glu	Tyr	Gln	Arg	His	Glu
		435					440					445			
Ala	Pro	Phe	Gly	Ala	Ser	Val	Tyr	Gln	Gly	Tyr	Leu	Gly	Thr	Arg	Lys
	450					455					460				
Tyr	Ser	Asp	Trp	Asp	Asn	Ala	Ser	Tyr	Phe	Thr	Asn	Asp	Gly	Phe	Glu
465					470					475					480
Leu	Gly	Gly	Pro	Arg	Asp	Ala	Leu	Gly	Thr	Leu	Asn	Arg	Glu	Gly	Leu
				485					490					495	
Ile	Gly	Tyr	Glu	Thr	Arg	Pro	Trp	Asn	Ile	Ser	Leu	Asn	Tyr	Ile	Ile
			500					505					510		
Lys	Ile	His	Tyr												
		515													